

## **EXHIBIT A**

**UNITED STATES PATENT AND TRADEMARK OFFICE**

---

**IN THE UNITED STATES PATENT TRIAL AND APPEAL BOARD**

---

MAZE INNOVATIONS, INC.  
Petitioner

v.

THE GREEN PET SHOP ENTERPRISES, LLC  
Patent Owner

---

CASE IPR: IPR2016-00117  
U.S. PATENT NO. 8,720,218

---

**PETITION FOR *INTER PARTES* REVIEW**

**Mail Stop *Patent Board***  
Patent Trial and Appeal Board  
U.S. Patent and Trademark Office  
P.O. Box. 1450  
Alexandria, VA 22313-1450

## **TABLE OF CONTENTS**

	<b><u>Page</u></b>
I. Introduction.....	1
II. Mandatory Notices Pursuant to 37 C.F.R. § 42.8.....	3
A. Real Party In Interest (37 C.F.R. § 42.8(b)(1)) .....	3
B. Related Matters (37 C.F.R. § 42.8(b)(2)).....	3
C. Notice Of Lead And Backup Counsel (37 C.F.R. § 42.8(b)(3)).....	3
D. Service Information (37 C.F.R. § 42.8(b)(4)) .....	4
III. Payment of Fees.....	4
IV. Standing .....	4
V. Statement Of Precise Relief Requested.....	4
VI. Background.....	5
A. Introduction to Phase Change Materials .....	5
B. The Alleged Improvement in the ‘218 Patent.....	9
VII. Full Statement Of The Reasons For The Relief Requested.....	13
A. The Relied-On Art Has Not Been Previously Considered.....	13
1. Fan (Ex. 1003) Was Not Considered During Examination .....	13
2. Xiong (Ex. 1004) Was Not Considered During Examination .....	15
B. Person of Ordinary Skill in The Art.....	16
C. Claim Construction .....	17
1. “pressure” (Claims 15, 16, 18, and 19).....	17
2. “pressure activated recharging cooling composition” (Claims 15, 16, 18, and 19).....	19
3. “endothermically activated and endothermically deactivated” (Claims 15, 16, 18, and 19).....	20
4. “channel” (Claims 15, 16, 18, and 19).....	21
D. Proposed Grounds of Rejection.....	23

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

1.	Ground 1: Claims 15, 16, 18, And 19 Are Unpatentable Under 35 U.S.C. § 102(b) As Anticipated By Fan. ....	23
a.	Claim 15.....	26
b.	Claim 16.....	34
c.	Claims 18 and 19 .....	37
2.	Ground 2: Claims 15, 16, 18, and 19 Are Unpatentable Under 35 U.S.C. § 103 As Obvious Over Fan.....	38
a.	Claim 15.....	39
b.	Claim 16.....	45
c.	Claims 18 and 19 .....	48
3.	Ground 3: Claims 15 And 16 Are Unpatentable Under 35 U.S.C. § 103 As Anticipated By Xiong.....	49
a.	Claim 15.....	49
b.	Claim 16.....	55
4.	Ground 4: Claims 15, 16, 18, And 19 Are Unpatentable Under 35 U.S.C. § 103 As Obvious Over Xiong in view of Fan. ....	57
a.	Claims 15 and 16 .....	58
b.	Claims 18 and 19 .....	59
VIII.	Conclusion .....	60

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

**LIST OF EXHIBITS**

- Ex. 1001: U.S. Patent No. 8,720,218 (“‘218 Patent”)
- Ex. 1002: Prosecution History for the ‘218 Patent
- Ex. 1003: Chinese Publication No. CN 101305877 B, English Language translation thereof, and translation declaration under 35 U.S.C. § 1746 in satisfaction of 37 C.F.R. § 42.63(b) (“Fan”)
- Ex. 1004: U.S. Patent No. 7,324,340 (“Xiong”)
- Ex. 1005: U.S. Patent No. 4,064,835 (“Rabenbauer”)
- Ex. 1006: U.S. Patent No. 7,036,162 (“Gatten”)
- Ex. 1007: U.S. Patent No. 6,482,332 (“Malach”)
- Ex. 1008: Prosecution History for U.S. Patent Application No. 14/226,393 (“‘393 Application”), current as of October 30, 2015
- Ex. 1009: Maze Innovations, Inc.’s Initial Non-Infringement and Invalidity Contentions with Exhibits (“Non-Infringement and Invalidity Contentions”)
- Ex. 1010: The Green Pet Shop Enterprises, LLC’s Initial Responses to Invalidity Contentions for U.S. Patent No. 8,720,218, with Exhibit
- Ex. 1011: Green Pet Shop Enterprises, LLC’s Initial Infringement Contentions, with Exhibits (“Infringement Contentions”)
- Ex. 1012: Excerpts from Webster’s Third New International Dictionary of the

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

English Language Unabridged (2002)

Ex. 1013: Excerpt from Shakhashiri, Bassam Z., *Chemical Demonstrations: A Handbook for Teachers of Chemistry* (1st ed. Vol. 1 Madison: U of Wisconsin 1983)

Ex. 1014: Excerpt from Ebbing, Darrell D., and Steven D. Gammon, *General Chemistry Enhanced Edition* (9th ed. Belmont: Brooks/Cole, 2009)

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

**I. INTRODUCTION**

Maze Innovations, Inc. d/b/a Hugs Pet Products (“Petitioner”) requests *Inter Partes* Review (“IPR”) of claims 15, 16, 18, and 19 (“challenged claims”) of U.S. Patent No. 8,720,218 (“‘218 Patent”) (Ex. 1001).

The ‘218 Patent discloses and claims so-called cooling platforms (or pads), which are structures designed to assist with cooling of an object that is warmer than and in contact with the pad. (*See generally* Ex. 1001 at Background).

Cooling platforms were ubiquitous long before the ‘218 Patent. For example, the ‘218 Patent acknowledges that then-existing “beds are known to have cooling mechanisms” and some are “available which use alternative or ‘non-electric’ means to cool [an object].” (Ex. 1001 at 1:17-25). Patent literature that published *more than 30 years* before the filing of the ‘218 Patent describes “air-conditioned pet bed[s]...with re-usable, pre-frozen, chemical ice-packs...” (Ex. 1005 at Abstract). Other patent literature predating the ‘218 Patent by almost a decade describes cooling mattresses having a number of pads including a liner and a cavity filled with a cooling medium, such that the cooling medium cools the object sitting on the mattress. (Ex. 1006 at Abstract). Even a cursory review of the patent literature reveals that cooling pads to help cool objects contacting or resting on the pad were not new at the time the ‘218 Patent was filed.

Recognizing this, the ‘218 Patent professes to improve over known cooling

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

pad products. (*See, e.g.*, Ex. 1001 at 1:27-28). The purported novelty of the ‘218 Patent lies in the claims’ requirement that a cooling composition within a cooling pad is “endothermically activated and endothermically deactivated upon the application and release of pressure, respectively.” (Ex. 1001 at cls. 15, 16, 18, and 19; *see also* Ex. 1002 at 153-155 (adding quoted language to obtain allowance)). However, when read in light of the specification, the challenged claims of the ‘218 Patent are nothing more than a straightforward recitation of conventional, well-known cooling platform technology. The challenged claims, when given their *broadest reasonable* interpretation, require nothing more than a cooling platform for cooling an object that includes a temperature regulation layer having an angled segment and channels and a composition that transfers heat from a warmer object what in *contact* with the object. This type of cooling mat, which relies on a heat sinking technique to transfer heat from a warmer object (contacting the cooling mat) to a cooler object (the mat itself), was well-known in the art prior to the filing of the ‘218 Patent. Moreover, the identical chemical composition disclosed and claimed in the ‘218 Patent—allegedly the point of novelty—was described as a suitable chemical composition in prior art cooling mat disclosures.

As described in more detail below, the Board should institute IPR and cancel claims 15, 16, 18, and 19 of the ‘218 Patent.



Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

**II. MANDATORY NOTICES PURSUANT TO 37 C.F.R. § 42.8**

**A. REAL PARTY IN INTEREST (37 C.F.R. § 42.8(B)(1))**

Petitioner Maze Innovations, Inc. (d/b/a Hugs Pet Products), a Missouri corporation with a principal place of business at 4059 State Road A, Montreal, MO, 65591, is the real party in interest.

**B. RELATED MATTERS (37 C.F.R. § 42.8(B)(2))**

The ‘218 Patent is being asserted against Petitioner in the case *Green Pet Shop Enterprises, LLC v. Maze Innovations, Inc.* in the Northern District of Illinois (Case No. 15-CV-01138). Petitioner is unaware that the ‘218 Patent is currently being asserted or has ever been asserted in the past in any other case.

Currently-pending U.S. Patent Application No. 14/226,393 (“‘393 Application”) was filed on March 26, 2014 as a continuation of the ‘218 Patent. Currently-pending U.S. Patent Application No. 14/695,909 was filed on April 24, 2015 as a continuation of the ‘393 Application.

Petitioner is unaware of any other judicial or administrative matters that would affect or be affected by a decision in this proceeding.

**C. NOTICE OF LEAD AND BACKUP COUNSEL (37 C.F.R. § 42.8(B)(3))**

Lead counsel is Jason A. Engel (Reg. No. 51,654), and backup counsel is Benjamin E. Weed (Reg. No. 65,939).

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

**D. SERVICE INFORMATION (37 C.F.R. § 42.8(B)(4))**

Papers concerning this matter should be served on Jason Engel and Benjamin Weed at K&L Gates LLP, 70 W. Madison St., Suite 3100, Chicago, IL 60602 (Tel. 312-372-1121; Fax 312-827-8000). Petitioner hereby consents to electronic service at the following electronic mail addresses:

[Jason.Engel.PTAB@klgates.com](mailto:Jason.Engel.PTAB@klgates.com)

[Benjamin.Weed.PTAB@klgates.com](mailto:Benjamin.Weed.PTAB@klgates.com)

**III. PAYMENT OF FEES**

The required fee for this Petition has been paid from Deposit Account No. 02-1818, and the Office is authorized to deduct any additional fees due in association with this Petition.

**IV. STANDING**

The Petition is being filed within one year of Petitioner being served with a complaint for infringement. Petitioner has not filed a civil action challenging the validity of any claims of the '218 Patent. Petitioner certifies that the '218 Patent, issued on May 13, 2014, is available for IPR and that Petitioner is not barred from requesting IPR of the '218 Patent.

**V. STATEMENT OF PRECISE RELIEF REQUESTED**

Petitioner requests review and cancellation of claims 15, 16, 18, and 19 of the '218 Patent on the following statutory grounds (*i.e.*, 35 U.S.C. §§ 102 or 103)

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

based on the following prior art references, identified by exhibit number:

Ground 1: Cancellation of claims 15, 16, 18, and 19 under 35 U.S.C. § 102(b) as anticipated by Chinese Patent Publication No. CN 101305877 B (“Fan”) (Ex. 1003).

Ground 2: Cancellation of claims 15, 16, 18, and 19 under 35 U.S.C. § 103 as obvious over Fan (Ex. 1003).

Ground 3: Cancellation of claims 15 and 16 under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 7,324,340 (“Xiong”) (Ex. 1004).

Ground 4: Cancellation of claims 15, 16, 18, and 19 under 35 U.S.C. § 103 as obvious over Xiong (Ex. 1004) in view of Fan (Ex. 1003).

## **VI. BACKGROUND**

### **A. INTRODUCTION TO PHASE CHANGE MATERIALS**

Phase Change Materials (“PCMs”) are an example of “rechargeable” compositions. (*See, e.g.*, Ex. 1004 at 2:56; *see generally id.* at 2:40-56). While PCMs are not specifically described in the ‘218 Patent, they were nonetheless well-known in the art prior to the ‘218 Patent, (*See, e.g.*, Ex. 1004; Ex. 1006; Ex. 1007).

PCMs are “chemical compounds that possess the physical property of changing between solid phase and liquid phase at a desirable temperature range.” (Ex. 1004 at 2:41-44). During “the process of a phase change, either melting or solidifying, the material respectively absorbs or releases a large amount of per-

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

mass thermal energy, or ‘heat of fusion’.” (Ex. 1004 at 2:47-50). This material property of PCMs “can be utilized to store away excessive heat produced by [an object] when the PCM turns into liquid, and slowly release the heat when the [ ] PCM solidifies again.” (Ex. 1004 at 2:52-55). This process of absorbing and releasing heat (and the resulting phase changes) “can be repeated as desired.” (Ex. 1004 at 2:56). The storage of heat from another object is an endothermic action, and the release of heat is an exothermic action. (Ex. 1012 at 5-8). Particular PCMs with particular chemical compositions can be selected to solidify (*e.g.*, freeze) and liquefy (*i.e.*, melt) at various temperatures as required by a particular application (*e.g.*, temperatures from +40° C to below -30° C or 104°F to below -22°F). (Ex. 1007 at Abstract, 4:14).

PCMs “with high freezing temperatures have the advantage of being rechargeable in commonly encountered ambient temperatures.” (Ex. 1007 at 6:48-50). Such a PCM might be useful in a cooling mat environment at room temperature, meaning it has a solid/liquid phase change temperature of 75°F. (*See, e.g.*, Ex. 1007 at 6:48-50). This example PCM would freeze (*i.e.*, become a solid) when its temperature goes below 75°F and would melt (*i.e.*, become a liquid) when its temperature exceeds 75°F. Such materials are useful inside cooling mats because they are solids at typical room temperature (*i.e.*, about 70°F), and become liquids when placed into contact with an object hotter than room temperature, such

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

as the body of a human or an animal.

A hypothetical scenario involving this exemplary PCM can be envisioned where the object sitting on the cooling platform is a dog, whose body temperature is typically about 102.5°F, which is above typical room temperature of about 70°F (*i.e.*, ambient temperature). A cooling platform in temperature equilibrium with the 70°F room temperature would contain the PCM in its solid phase, since ambient temperature (and thus the temperature of the PCM) is below the 75°F melting point of the PCM. When the dog contacts the cooling platform, heat from the dog's body is transferred into the PCM via conduction. (*See, e.g.*, Ex. 1004 at Abstract, 2:47-50). As the PCM absorbs heat from the dog, the temperature of the PCM increases until it exceeds the phase change temperature of 75°F. (Ex. 1004 at 2:52-55). At that point, the PCM "melts" or undergoes a phase change from a solid to a liquid. (*Id.*). The cooling platform continues to absorb thermal energy until its temperature is equal to the dog's body temperature, at which point thermal equilibrium is achieved. If the dog moves off the mat while the PCM is a liquid (meaning the cooling platform has a temperature above 75°F), the ambient air is at a lower temperature than the cooling platform. Through conduction, the heat from the PCM is absorbed into the ambient air, and the temperature of the PCM lowers to equilibrium at the 70°F ambient temperature. When the PCM crosses the 75°F phase change or "freezing" point, it changes from a liquid to a solid. (*Id.*). In this

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

scenario, it could be said that the PCM “recharges” by transferring heat to the ambient air and re-solidifying when its temperature crosses the phase change temperature. The process can then be repeated as described above when the dog subsequently contacts the cooling platform.<sup>1</sup>

PCMs are not described anywhere in the ‘218 Patent. (*See generally* Ex. 1001). Despite this, the use of PCMs in a “rechargeable” cooling platform was well-known prior to the ‘218 Patent. For example, Xiong discloses a cooling pad that “contains a phase-changing compound...to effectively transfer heat away from the [object] by conduction.” (Ex. 1004 at Abstract). U.S. Patent No. 7,036,162 (“Gatten”) discloses that its cooling platform preferably uses a phase change material (PCM) for the cooling medium. (Ex. 1006 at 1:60-63 and 2:57-60). PCMs having a freezing temperature in a range applicable to a preferred embodiment of the ‘218 Patent (*i.e.*, in pet beds or mats) were disclosed in U.S. Patent No. 6,482,332 (“Malach”). (*See* Ex. 1007 at 8:13-14, 8:20-28, 11:20-21).<sup>2</sup>

---

<sup>1</sup> A conventional water bed works according to the same heat transfer principals, although because the freezing point of water is lower than standard room temperature, no phase change occurs when a person lies on the water bed.

<sup>2</sup> Gatten (Ex. 1006) incorporates Malach (Ex. 1007) by reference and notes that Malach discloses an example of a material that can be used as a “cooling

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

Malach discloses a phase change material that would be favorable for use in a cooling platform because it “changes phase [] between 15 and 20° C” (*i.e.*, between 59°F and 68°F). (Ex. 1007 at 4:7-8). Malach also discloses several other suitable PCMs that could be used in cooling bed applications. (Ex. 1007 at 8:9-29). These exemplary PCMs include butanediol isomers, such as the 1,4-butanediol isomer, which has a melting point of approximately 20°C (*i.e.*, 68°F), and polyethylene glycols, such as PEG 600, which has a melting point between 20 and 25°C (*i.e.*, between 68°F and 77°F). (Ex. 1007 at 8:13-14, 8:25).

If Patent Owner The Green Pet Shop Enterprises, LLC (“PO”) argues that the challenged claims’ recitation of *rechargeable* compositions implies the use of PCMs, PCMs were well known for use in cooling mats long before the ‘218 Patent was filed. Any argument that the challenged claims are patentable based on an alleged recitation of a PCM is meritless both because the challenged claims cannot cover technology not described in the ‘218 Patent and because the prior art is replete with discussions PCMs used in cooling mat applications.

**B. THE ALLEGED IMPROVEMENT IN THE ‘218 PATENT**

The ‘218 Patent discloses a cooling platform for cooling an object including “a temperature regulation layer 110 (illustrated in FIG. 2), a support layer 140

---

medium 18” in an “interior cavity 16” of a cooling pad. (Ex. 1006 at 2:57-65).

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

(illustrated in FIG. 3), and a channeled covering layer 150.” (*Id.* at 2:14-16).

The alleged invention of the ‘218 Patent lies solely in the composition within the cooling mat. Specifically, the ‘218 Patent claims “a pressure activated recharging cooling composition [which is] endothermically activated and endothermically deactivated upon the application and release of pressure...” (*Id.* at 5:53-57, 6:22-26, 6:51-55, 7:3-7, 7:19-23, 7:34-38, 7:49-53, 8:11-15, 8:29-33, and 8:47-51). This limitation was added, by Examiner’s Amendment, to overcome the prior art of record during examination. (Ex. 1002 at 153-155). Despite the title of the ‘218 Patent being “Pressure Activated Recharging Cooling Platforms” (also added by amended during prosecution, *see* Ex. 1002 at 98), the sole discussion of pressure-activated compositions is the following paragraph:

In another embodiment, the composition 110A can be activated by pressure, wherein the pressure of a[n] object sitting on the cooling platform 100 activates the composition 110A, triggering an endothermic process and subsequent cooling. Upon the release of that pressure, the composition 110A undergoes a subsequent recharge, essentially the reverse of the initial reaction. The above is consistent with Le Chatelier’s principle, in that, the reaction reverses upon the application or absence of pressure. In this embodiment, the composition 110A is comprised of: thirty percent carboxymethyl cellulose; twenty percent water; thirty-five percent polyacrylamide; and at least fifteen percent alginic acid. The aforementioned composition 110A also provides a cooling effect for an increased



Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

duration over other known compositions.

(Ex. 1001 at 3:17-30). The *sole* example of a chemical composition that can provide the claimed “pressure activated recharging cooling composition” is a composition including *water and polyacrylamide*. (*Id.* at 3:25-28). The purported point of novelty of the ‘218 Patent, if supported by the specification of the ‘218 Patent, involves the inclusion of a composition of water and polyacrylamide in a cooling mat. Providing such a mixture necessarily achieves the claimed pressure activated recharging cooling composition.

Upon closer scrutiny, it is clear that the ‘218 Patent’s purported point of novelty is not actually a patentable distinction over the prior art. On the one hand, the exact chemical composition described and claimed in the ‘218 Patent was known for use *in cooling mats* long before the ‘218 Patent was filed. On the other hand, this alleged point of novelty, which was added to the challenged claims during prosecution in an Examiner’s Amendment (Ex. 1002 at 153-155), recites a limitation that is a physical impossibility. There is simply no composition described in the ‘218 Patent that undergoes an endothermic reaction upon the application of pressure *and* “recharges” or reverses, resulting in an exothermic reaction, upon the release of that pressure. The only composition described in the ‘218 Patent that can be activated to undergo an endothermic reaction is that of

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

ammonium nitrate and distilled water. (Ex. 1001 at 3:13-16).<sup>3</sup> However, the endothermic reaction involved with this composition is a chemical reaction activated *by the addition of water*, not by the application of pressure. When the components of this composition are mixed, an *irreversible* endothermic reaction occurs; once the water mixes with the ammonium nitrate and the endothermic reaction takes place, the water cannot be separated from the ammonium nitrate and the composition cannot be “recharged.”

Under the *only* reasonable interpretation of the challenged claims, the prior art clearly discloses each recited feature by disclosing the exact chemical composition disclosed as satisfying the claimed composition. Any construction that actually requires a pressure-activated, rechargeable, endothermic reaction—which is unquestionably *not enabled*—is unreasonable in light of the disclosure of the ‘218 Patent, and is thus incorrect.

---

<sup>3</sup> Ammonium nitrate and water are used in “instant cold packs” that rely on two separate bags or bladders (one bladder containing water and a second bladder, within the first bladder, containing ammonium nitrate). When the inner bladder is broken, the water and the ammonium nitrate mix and an irreversible endothermic chemical reaction occurs that absorbs heat from the surroundings, quickly lowering the pack’s temperature. (See Ex. 1013 at 8-9; Ex. 1014 at 488).

**VII. FULL STATEMENT OF THE REASONS FOR THE RELIEF REQUESTED**

A successful IPR petition must demonstrate a reasonable likelihood that the Petitioner will prevail with respect to at least one claim. 35 U.S.C. § 314(a). This Petition is reasonably likely to prevail with respect to at least one challenged claim because Fan (Ex. 1003) and Xiong (Ex. 1004) each disclose or render obvious the challenged claims of the ‘218 Patent either alone or in combination. Before the time of the alleged invention, it was well-known to form cooling platforms for cooling objects by providing angled segments with channels as claimed in the ‘218 Patent, and to fill the cooling platforms with a cooling composition (either a PCM or a non-PCM) that acts as a heat sink to transfer heat from an object on the cooling platform to the composition. Under the broadest reasonable interpretation, this is all that is required by the challenged claims. The prior art relied on herein evidences such knowledge, and renders challenged claims 15, 16, 18, and 19 of the ‘218 Patent unpatentable according to the presented Grounds.

**A. THE RELIED-ON ART HAS NOT BEEN PREVIOUSLY CONSIDERED**

Institution is warranted under 35 U.S.C. § 325(d) because this Petition relies on new art not considered during examination of the ‘218 Patent.

**1. Fan (Ex. 1003) Was Not Considered During Examination**

The Petition relies on Fan (Ex. 1003), which was not considered during examination of the ‘218 Patent, and which discloses, for use in a cooling platform,

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

the *same chemical composition* described and claimed in the ‘218 Patent as an example of a “pressure activated recharging cooling composition.” The unconsidered Fan reference addresses the Examiner’s sole basis for patentability during examination, and thus renders the challenged claims unpatentable.

PO may attempt to avoid Fan’s disclosure of the same cooling composition described and claimed in the ‘218 Patent by arguing that Fan was considered during the prosecution of the ‘393 Application (a continuation of the ‘218 Patent), which received a notice of allowance on October 14, 2015. (*See* Ex. 1008 at 136-137 (initialed Information Disclosure Statement)). PO, however, deprived the Examiner of key information that would have altered examination of the ‘393 Application. First, PO failed to inform the Examiner that the ‘218 Patent has been in litigation since February 5, 2015 and is the subject of a counterclaim for invalidity. Second, PO failed to provide the Examiner with copies of the Chinese language versions of Fan, much less the certified translations of Fan that Petitioner produced to PO on June 24, 2015 as part of its Non-Infringement and Invalidity Contentions in the co-pending district court proceeding. (*See* Ex. 1009). Rather, PO referenced U.S. patent family documents that are not prior art under 35 U.S.C. § 102(b). Third, and perhaps most important, PO failed to provide the Examiner with Petitioner’s district court Non-Infringement and Invalidity Contentions, which contain a detailed analysis of how Fan (among other references) anticipates and

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

renders obvious the claims of the ‘218 Patent. (*See* Ex. 1009).

If PO had provided this necessary information to the Examiner, including an indication that a *competitor* accused of infringing the parent ‘218 Patent has asserted in litigation that the ‘218 Patent is invalid over Fan, the Examiner would have conducted a more detailed review of the pending claims in view of Fan. As it stands, however, the Examiner simply relied on his previous examination of the ‘218 Patent by issuing a double-patenting rejection over the claims of the ‘218 Patent. (*See* Ex. 1008 at 70-75).

Since Fan was neither considered during original examination nor meaningfully considered during examination of the ‘393 Application, it is proper to institute IPR of the ‘218 Patent on the basis of the grounds below.

**2. Xiong (Ex. 1004) Was Not Considered During Examination**

IPR should also be instituted because this Petition relies on Xiong (Ex. 1004). Xiong was neither considered during examination of the ‘218 Patent nor was it considered during examination of the ‘393 Application. It too was included in Petitioner’s Non-Infringement and Invalidity Contentions in co-pending district court litigation. (Ex. 1009 at 6-9, 49-57). PO’s decision not to submit Petitioner’s Non-Infringement and Invalidity Contentions to the Examiner of the ‘393 Application deprived the Examiner of the opportunity to consider Xiong. Institution on the basis of Xiong alone, and in view of Fan, is proper.

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

**B. PERSON OF ORDINARY SKILL IN THE ART**

A person of ordinary skill in the art is a hypothetical person presumed to know the relevant prior art. *Gnosis S.p.A. v. S. Ala. Med. Sci. Found.*, IPR2013-00116, Final Written Decision (Paper 68) at 9 (citing *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995)). Such person is of ordinary creativity, not merely an automaton, and is capable of combining teachings of the prior art. *Id.* (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 420-21 (2007)). Citing the Federal Circuit, the Board has held “the references themselves represent the level of ordinary skill in the art.” *eBay Inc. v. Locata LBS LLC*, IPR2014-00585, Final Written Decision (Paper 31) at 6 (citing *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the level of ordinary skill in the art usually is evidenced by the references themselves); *In re GPAC*, 57 F.3d at 1579 (finding that the Board of Patent Appeals and Interferences did not err in concluding that the level of ordinary skill in the art was best determined by the references of record)).

From the “Field of the Invention” of the ‘218 Patent and the references presented herein, it is evident that a person of ordinary skill in the art at the time of filing of the ‘218 Patent had at least some experience with cooling pad techniques and a general understanding of heat transfer. (*See, e.g.*, Ex. 1001 at 1:6-7 (“invention relates to temperature controlled platforms”)).

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

**C. CLAIM CONSTRUCTION**

During IPR, claim terms are given their “broadest reasonable construction.” 37 C.F.R. § 42.100(b). A correct construction under this standard must be “consistent with the specification” of the patent. *In re Cuozzo Speed Techs., LLC*, 778 F.3d 1271, 1279 (Fed. Cir. 2015) (quoting *In re Rambus, Inc.*, 753 F.3d 1253, 1255 (Fed. Cir. 2014)). Claim terms are generally given their ordinary and customary meaning to an artisan in the context of the disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc)). Any special definition must be described in the specification “with reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioner addresses the claim terms it believes warrant particular attention immediately below. Where not specified below, Petitioner submits that the claim terms of the ‘218 Patent should be given their ordinary and customary meaning. Petitioner’s position regarding claim scope is not to be taken as a concession regarding the appropriate scope to be given the challenged claims in a court or other adjudicative body or under different claim interpretation standards.

**1. “pressure” (Claims 15, 16, 18, and 19)**

The ‘218 Patent discloses that “the composition 110A can be activated by *pressure*, wherein the *pressure* of a[n] object *sitting on the cooling platform* 100

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

activates the composition 110A, triggering an endothermic process and subsequent cooling.” (Ex. 1001 at 3:17-20).<sup>4</sup> Each challenged claim requires a “*pressure* activated recharging cooling composition...endothermically activated and deactivated upon the application and release of *pressure*...” (*Id.* at cls. 15, 16, 18, and 19).

Nothing in the specification or claims defines a magnitude or range of pressures required by the challenged claims; instead, some amount of contact is required to activate and deactivate the recharging cooling composition. For example, the ‘218 Patent explains that the “composition 110A is able to recharge after the alleviation of pressure (after the object moves).” (*Id.* at 5:13-14). The moving of an object to recharge the composition shows that the composition recharges after there is no longer *contact* between the cooling platform and the object. Additionally, the ‘218 Patent explains that the “object *contacts* the channeled covering layer 150 exerting pressure over the cooling platform 100,” and thus specifically correlates the requisite act (applying pressure) with *contact*. (*Id.* at 4:43-45). Furthermore, the specification of the ‘218 Patent explains that “the presence of the predefined distance from the top and bottom of the angled segment 120, essentially prevents the dispersion of the composition 110A from the

---

<sup>4</sup> All emphasis added unless otherwise noted.



Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

pressure the object exerts on the cooling platform 100.” (*Id.* at 5:23-27). The broadest reasonable interpretation must encompass the ‘218 Patent’s use of “pressure” as a synonym for “contact.” As discussed above, construing “pressure” any more narrowly than “contact” results in claims that recite a physical impossibility, as there are no viable, known compositions (much less compositions disclosed in the ‘218 Patent) that undergo a reversible endothermic reaction upon the application of a certain amount of pressure.

Petitioner therefore submits that the broadest reasonable interpretation of the claim phrase “**pressure**” in the context of the ‘218 Patent is “**contact.**”

**2. “pressure activated recharging cooling composition”  
(Claims 15, 16, 18, and 19)**

The challenged claims each requires a “*pressure activated recharging cooling composition...endothermically activated and endothermically deactivated upon the application and release of pressure...*” (Ex. 1001 at cls. 15, 16, 18, and 19). Claims 18 and 19 further require that the “pressure activated recharging cooling composition [is] comprised of water and polyacrylamide.” (*Id.* at cls. 18 and 19). Otherwise, claims 15 and 16 are identical to claims 18 and 19, respectively.<sup>5</sup> A composition containing “water and polyacrylamide” is not

---

<sup>5</sup> Although claims 18 and 19 are written as independent claims, their identity to claims 15 and 16 and addition of a specifically required composition means that

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

required by this claim term, but is certainly encompassed by this claim term.

Petitioner submits that the broadest reasonable interpretation—indeed, *any* reasonable interpretation—of **“pressure activated recharging cooling composition”** as that phrase is used in claims 15, 16, 18, and 19 must be satisfied by a composition containing **“water and polyacrylamide.”**

**3. “endothermically activated and endothermically deactivated” (Claims 15, 16, 18, and 19)**

Each challenged claim requires a “pressure activated recharging cooling composition *endothermically activated* and *endothermically deactivated* upon the application and release of pressure...” (Ex. 1001 at cls. 15, 16, 18, and 19).

The ‘218 Patent does not state what it means by “endothermically activated.” Instead, it discloses that the “composition 110A can be activated by pressure, wherein the pressure of a[n] object sitting on the cooling platform 100 activates the composition 110A, triggering an endothermic process and subsequent cooling.” (*Id.* at 3:17-20). “Endothermic” is well-defined as being “characterized by or formed with absorption of heat.” (Ex. 1012 at 5-6). Thus, according to the ‘218 Patent, upon an object contacting the cooling mat, the disclosed composition

---

they are effectively *dependent* claims from independent claims 15 and 16. This supports a construction of “pressure activated recharging cooling composition” that can be satisfied at least by the claimed composition of water and polyacrylamide.

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

absorbs heat—an endothermic result. The broadest reasonable interpretation of **“endothermically activated,”** which reflects the described absorption of heat, is **“becomes endothermic.”**

The ‘218 Patent also does not describe what it means by “endothermically deactivated.” Other than in the claims, the ‘218 Patent does not use the word “deactivated” at all. It discloses that “[u]pon the release of that pressure, the composition 110A undergoes a subsequent recharge, essentially the reverse of the initial reaction.” (Ex. 1001 at 3:21-23). The reverse of “triggering an endothermic process” is triggering an exothermic process. “Exothermic” is well-defined as “characterized by or formed with evolution of heat.” (Ex. 1012 at 798). Thus, according to the ‘218 Patent, upon an object losing contact with the cooling mat, the disclosed cooling mat releases heat—an exothermic result. The broadest reasonable interpretation of **“endothermically deactivated,”** which reflects the described emission of heat, is **“becomes exothermic.”**

**4. “channel” (Claims 15, 16, 18, and 19)**

The challenged claims require “channels” that help define angled segment(s). Channel is commonly defined as a “long gutter, groove, or furrow.” (Ex. 1012 at 3-4). The ‘218 Patent does not redefine “channel”; instead, it uses the term consistent with this definition to describe that the “channels 130 effectively space the top and bottom sides of each angled segment 120 at a predefined

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

distance.” (Ex. 1001 at 2:28-29; *see also id.* at Figs. 2-4). “In an example embodiment, the channels 130 may completely segment the plurality of angled segments 120.” (*Id.* at 4:32-34). The ‘218 Patent’s discussion of “channels” is consistent with the definition of a channel as an “elongated groove.”

PO may attempt to argue for importing a limitation in the claims of the ‘218 Patent that would require the claimed channels to span the entirety of the claimed cooling platform. However, other than the Figures (which do not restrict the claim language, particularly under the broadest reasonable interpretation standard applicable here) and the sections cited above, there is no other structural disclosure related to the “channels” in the ‘218 Patent. There is certainly no clear and unambiguous indication that the word “channel” is intended only to cover a groove that spans an entire dimension of the cooling platform. Indeed, the ‘218 Patent explicitly states that the “channels *substantially* form sides,” not that they *fully* form sides. It also describes two different embodiments, one in which “the predefined distance can equal zero, thus completely forming each angled segment 120 and cutting off any interconnection therein” and another in which “the predefined distance can be measured depending on the object using the cooling platform 100. In this embodiment, the predefined distance allows for interconnection between the angled segments 120 of the composition 110A.” (Ex. 1001 at 2:29-37). Thus, in some embodiments, the channels explicitly do not fully

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

isolate the angled segments from one another, indicating that there is no requirement the elongated grooves reach the perimeter of the cooling mat. Finally, PO argued in its Infringement Contentions during litigation that channels can include the sealed outer edges of a cooling pad (Exhibit 1014 at 4, 12). Thus, unless PO's Infringement Contentions reflect an unreasonably broad interpretation, the broadest reasonable interpretation of a “channel” is “elongated groove,” and no limitation as to the length of the groove should be imported.

**D. PROPOSED GROUNDS OF REJECTION**

**1. Ground 1: Claims 15, 16, 18, And 19 Are Unpatentable Under 35 U.S.C. § 102(b) As Anticipated By Fan.**

Fan was filed in China as Chinese Application Number 200810063081.4 on July 9, 2008. (Ex. 1003).<sup>6</sup> It published on November 19, 2008 as Chinese publication number CN 101305877 A, and the version of Fan submitted herewith published on December 28, 2008 at CN 101305877 B. (*Id.*). The Chinese “B” publication of Fan, submitted as Ex. 1003, is prior art under 35 U.S.C. § 102(b).

U.S. Patent Application No. 12/458,320 was filed on July 8, 2009 and claims priority to Fan. It published as U.S. Patent Publication No. 2010/009128 on

---

<sup>6</sup> Ex. 1003 contains the Chinese-language version of CN 101305877 at pages 1-7, an English-language translation at pages 8-18, and the affidavit required by 37 C.F.R. § 42.63(b) (as a declaration as permitted by 37 C.F.R. § 42.2) at page 19.

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

July 8, 2009, and issued as U.S. Patent No. 8,381,495 on February 26, 2013. Fan's U.S. counterpart is therefore prior art to the '218 Patent under 35 U.S.C. §§ 102(a) and (e) as of July 8, 2009. As noted above, neither Fan nor its U.S. counterpart were considered during examination of the '218 Patent. (*See* Section VII.A.1).

Fan discloses a gel pad with "high heat absorption capacity." (Ex. 1003 at 8, Abstract). Fan's invention "aims to overcome the disadvantages of the existing products" (*id.* at 13, ¶ 3), which include "[w]ater pouches...used in daily life." (*Id.* at 12, ¶ 2). Fan discloses that its invention constitutes an improvement over the known practice of placing such water pouches "on a bed, sofa, etc [which] does not only provide comfort but can also serve as a physiotherapeutic treatment." (*Id.*). Problems with this practice involve water pouches breaking either by being "pierced through by sharp objects" or by the exertion of "excessive pressure [which] will cause the water pad to be burst and result in water leakage and a spoilt pouch." (*Id.*). Fan also notes that "due to the fluidity of water the water pad has a relatively poor stability, and this results in discomfort from rocking." (*Id.*).

Fan's overcomes such disadvantages "by providing a gel pad whose manufacturing process is simple and which is low-cost, convenient and reliable and not prone to being pierced through or squeezed..." (*Id.* at 13, ¶ 3). Fan's "gel pad comprises an enclosed pouch made of two flakes, characterized in that the pouch is filled with gel and the gel is laminar." (*Id.* at 8, Abstract). Fan discloses

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

“heating to melt the surface of the plastic layer, and making the abutted flakes to be an enclosed pouch with a filling orifice.” (*Id.* at 13, ¶ 7). The pouch of Fan can be filled by mixing water and a monomeric solution, which includes a “water-soluble monomer” such as “polyacrylamide and/or methyl polyacrylamide.” (*Id.* at 16, ¶¶ 20-21). Fan also discloses that “one or more reinforcing ribs 6 may be provided at the central portion of the pouch 2 during the manufacture thereof to directly bond the two flakes together, and this facilitates folding of the gel pad at the reinforcing ribs 6 as well as ventilation during use.” (*Id.* at 15, ¶ 16).

In the co-pending district court litigation, Petitioner served a claim chart on PO applying Fan to claims 15, 16, 18, and 19 of the ‘218 Patent. (Ex. 1009 at 19-28). PO’s sole alleged distinction between Fan and claims 15 and 18 is that Fan allegedly does not “disclose a ‘pressure activated recharging cooling composition’ that is ‘endothermically activated and endothermically deactivated.’” (Ex. 1010 at 7, 11-12). With regard to claims 16 and 19, PO additionally asserts that Fan does not disclose “a plurality of angled segments.” (*Id.* at 10, 12). Other than asserting that Fan lacks a *plurality* of angled segments (while conceding it discloses *at least one* angled segment), PO has not contested that the structure of the cooling mat of Fan is identical to the structure claimed in the ‘218 Patent. (*Id.*). As discussed below, Fan discloses the exact (and only) chemical composition disclosed and

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

claimed in the ‘218 Patent, and therefore anticipates claims 15, 16, 18, and 19.<sup>7</sup>

a. Claim 15

1. The Preamble

The claim 15 preamble recites “[a] cooling platform for cooling an object”; the remainder of the claim defines the platform’s structure. (Ex. 1001 at cl. 15).

Fan is directed to a cooling platform for cooling an object. (*See* Ex. 1003 at 8, Abstract (gel pad with “high heat absorption capacity.”); 14, ¶ 11 (the “gel pad...uses a gel instead of conventionally used water...and the gel has a water content of about 70% and hence a high heat absorption capacity similar to that of water.”)). Fan’s statement that its gel pad achieves high heat absorption discloses that heat will be absorbed from objects on the gel pad warmer than the pad, and that such objects will thus be cooled. (*Id.*). Fan thus discloses the preamble.

---

<sup>7</sup> PO may argue that the examiner of the ‘218 Patent was aware of compositions having water and polyacrylamide. (*See* Ex. 1010 at 11). This argument is without merit, as the examiner was not aware of Fan, nor was the examiner aware of any reference (like Fan) that disclosed using compositions having water and polyacrylamide in a cooling platform.

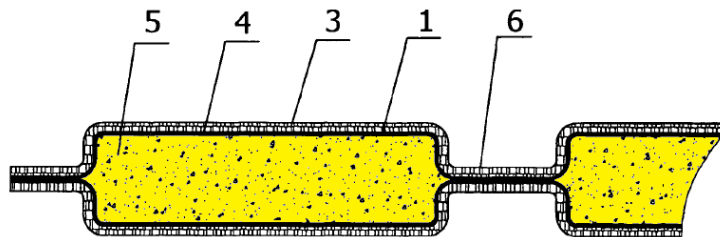


Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

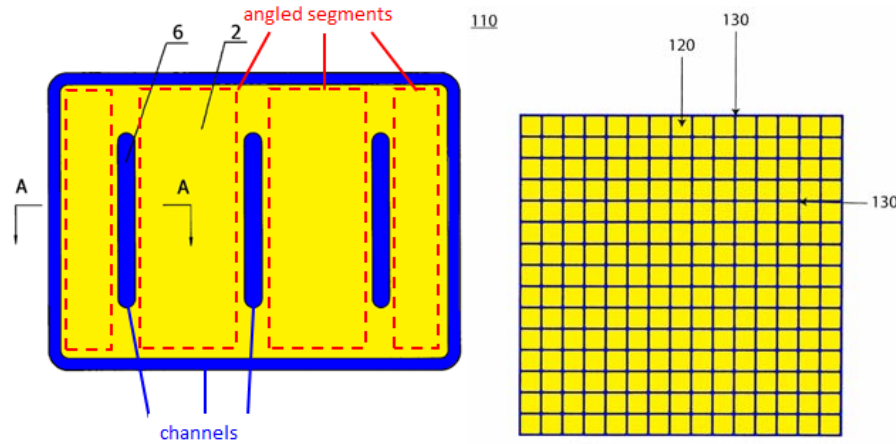
## 2. The “Temperature Regulation Layer” Limitation

Claim 15 further requires “a temperature regulation layer, the temperature regulation layer having an angled segment formed by a top side and a bottom side at a predefined distance, and channels, wherein the channels form sides by contacting the top side with the bottom side...” (Ex. 1001 at cl. 15).

Fan discloses the temperature regulation layer having an angled segment in the form of “a gel pad comprising a pouch 2 made of two flakes 1, wherein the two flakes 1 are made of two laminated materials made by coating plastic material on a woven fabric or flocked fabric 3, and a plastic layer 4 is made as an inner layer of the pouch 2.” (Ex. 1003 at 14-15, ¶ 16). Fig. 2 shows that the top and bottom flakes (numeral 1) are joined at points indicated by numeral 6 to form pouches (highlighted in yellow) each corresponding to the claimed angled segment:



(*Id.* at 18, Fig. 2). Fig. 1 of Fan (below left) illustrates four angled segments, indicated by dashed red lines, formed by the structures 6 labeled as “channels”; these are very similar to the angled segments identified with numeral 120 in in Fig. 2 and formed by channels 130 of the ‘218 Patent (below right):

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

(Ex. 1003 at 18, Fig. 1; Ex. 1001 at Fig. 2). Like the ‘218 Patent, Fan discloses that the laminated materials that can be used as the described “flakes” can be made by “coating plastic material on a woven fabric or flocked fabric 3, and a plastic layer 4 is made as an inner layer of the pouch 2.” (*Compare* Ex. 1003 at 14-15, ¶ 16 *with* Ex. 1001 at 3:32-37 (“The channeled covering layer 150 can encompass both the support 140 and temperature regulation layers 110...[and] can comprise a piece of fabric or netting, which can include, but is not limited to, plastic, nylon or cloth netting, or a micro-fiber material with a waterproof layer.”)).

Fan’s discussion of reinforcing ribs 6 further teaches the claimed angled segment and channels. For example, Fan discloses that “[f]or a pouch 2 with a larger area, to prevent large area of separation between the two flakes 1 which would result in movement of the gel 5, one or more *reinforcing ribs* 6 may be provided at the central portion of the pouch 2 during the manufacture thereof to directly bond the two flakes together, and this facilitates folding of the gel pad at

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

the reinforcing ribs 6 as well as ventilation during its use.” (Ex. 1003 at 15, ¶ 16). Fan’s reinforcing ribs 6 serve the same purpose as the channels of the ‘218 Patent. For example, the ‘218 Patent states that “the channels have at least two advantages. First, the channels 130 are designed to mix air with the cooling process between the object and the channeled covering layer 150. Second, the channels 130 substantially prevent or minimize the composition 110A from being pushed out of the angled segment 120.” (Ex. 1001 at 4:52-57). The ‘218 Patent states that another advantage is that the “channels 130 allow for a mixture of air flow between the object and the cooling platform 100, effectively cooling the object at a quicker rate.” (*Id.* at 5:21-23). Similarly, Fan discloses that the “reinforcing ribs 6” are used “to prevent large area of separation between the two flakes 1 which would result in movement of the gel 5” and also to facilitate “ventilation during [the gel pad’s] use.” (Ex. 1003 at 15, ¶ 16). Fan discloses the claimed angled segment and channels and discloses the same reasons for providing those structural components.

Under the broadest reasonable interpretation of “channel” as “elongated groove,” the structures identified in Fig. 1 of Fan as the joining point between the top and bottom flakes, as well as reinforcing ribs 6, are elongated grooves and thus disclose the claimed “channel.”

PO’s district court arguments further support that Fan discloses the claimed angled segment and channels. In arguing that Petitioner infringes the ‘218 Patent,

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

PO argued that the claimed “channels” can include the sealed outer edges of a cooling pad. (Ex. 1011 at 10, 18). Thus, under PO’s interpretation of the claims to assert infringement (which Petitioner assumes, for purposes of this proceeding, is at least reasonable), Fan discloses the claimed temperature regulation layer having an angled segment and channels, as required by claim 15. Indeed, referring to the portions highlighted in blue in Fig. 1 of Fan above, under PO’s interpretation of the claims, Fan discloses seven channels (3 reinforcing ribs and 4 sealed outer edges) and four angled segments (illustrated in red in the reproduction of Fig. 1 above). (Ex. 1003 at 18, Fig. 1). Consistent with this theory, PO did not dispute in the district court case that Fan discloses the claimed “temperature regulation layer” having the recited structural elements. (Ex. 1010 at 7, 11-12).

3. The “Pressure Activated Recharging Cooling Composition” Limitation

Claim 15 requires “a pressure activated recharging cooling composition within the temperature regulation layer, the pressure activated recharging cooling composition endothermically activated and endothermically deactivated upon the application and release of pressure, respectively.” (Ex. 1001 at cl. 15).

Fan discloses that once the pouch is made by joining flakes as discussed above, it is filled with a monomeric solution. (Ex. 1003 at 13, ¶ 8). Specifically, according to Fan, “[f]illing of monomeric solution” includes “mixing water, monomer(s), a cross-linking agent and a polymerization initiator to produce a

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

monomeric solution to be filled into the pouch through the filling orifice.” (*Id.*). The filled pouch is placed into a heater for heating “so as to facilitate a complete polymerization and to thereby produce a laminated polymer (i.e. a gel).” (*Id.* at 13, ¶ 9). Fan states that “[a]s result of the polymerization of a monomeric solution in the pouch 2, a polymer (i.e. a gel 5) is generated therein; the gel 5 formed in the pouch 2 is laminar, and the gel 5 usually has a thickness between 0.8mm and 5mm.” (*Id.* at 15, ¶ 16). Fan thus discloses that the gel (which corresponds to the pressure activated recharging cooling composition as described below) is within the temperature regulation layer (i.e., the pouch) as required by claim 15.

With regard to the monomers used to create the gel of Fan, Fan states:

The monomer(s) referred to are water-soluble monomer(s) used for making highly absorbent polyacrylic resins, e.g. acrylic acid and alkali metal salts thereof, methacrylic acid and metal salts thereof, one or more esters generated by methacrylic acid or acrylic acid; or monomer(s) used for making highly absorbent polyacrylamide materials, e.g. *polyacrylamide* and/or methyl polyacrylamide; or combinations of the aforementioned two monomers.”

(Ex. 1003 at 16, ¶ 21). It also discloses that one component of its gel is water. (*See id.* at 8, Abstract (“[T]he gel has a *water* content of about 70% and hence a high heat absorption capacity”); 14, ¶ 11; 16, ¶ 20).

The monomeric solution disclosed in Fan includes the same components (i.e., water and polyacrylamide) as the embodiment of the ‘218 Patent where “the

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

composition 110A can be activated by pressure, wherein the pressure of an object sitting on the cooling platform 100 activates the composition 110A...” (Ex. 1001 at 3:17-19). This embodiment of Fan also discloses the identical composition recited in those claims of the ‘218 Patent where a chemical makeup of the “pressure activated recharging cooling composition” is specified. (*Id.* at cls. 17, 18, and 19). Under the broadest reasonable interpretation of the ‘218 Patent’s recitation of a “pressure activated recharging cooling composition,” Fan’s recitation of the exact composition described and claimed in the ‘218 Patent discloses the “recharging cooling composition” required by this limitation.

Fan’s composition is a cooling composition with good endothermic performance. (*See* Ex. 1003 at 8, Abstract (“[T]he gel has a *water* content of about 70% and hence a high heat absorption capacity.”); *see also id.* at 14, ¶ 11). When a warm object contacts the gel pad in Fan, the high heat absorption capacity of the cooling composition enables the pad to absorb heat from the object, thereby reducing the temperature of the object (*i.e.*, the gel becomes endothermic). (*Id.*; *see also* Ex. 1012 at 5-6). Similar to the ‘218 Patent, once the object is no longer contacting the pad in Fan, it will release the heat back to the room (*i.e.*, the gel becomes endothermic). (Ex. 1003 at 8, Abstract; 14, ¶ 11; *see also* Ex. 1012 at 7-8). Thus, under the broadest reasonable interpretation of “pressure,” Fan discloses that its cooling composition is activated when a warm object *contacts* the pad and

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

deactivated when the warm object *loses contact* with the pad. Also under the broadest reasonable interpretation, Fan discloses a cooling composition that is endothermically activated and endothermically deactivated (*i.e.*, becomes endothermic and exothermic upon contact and release of contact, respectively, with an object warmer than ambient temperature).

If PO argues that pressure involves an application of non-zero *force*, contact between two objects results in a non-zero force being applied by the objects to one another. Moreover, Fan discloses that the object resting on its gel pad is applying a non-zero force equal to the weight of the object. (Ex. 1003 at 13, ¶ 3 (gel pad products “not prone to being pierced through or squeezed”)). Indeed, one of the problems Fan solved is that “excessive pressure [on known pads] cause[d] the water pad to be burst....” (Ex. 1003 at 12, ¶ 2). Thus, Fan discloses that it is the pressure of the object on the gel pad that activates the transfer of heat to the gel, and the lack of pressure that activates the transfer of heat out of the gel.

In summary, Fan discloses the identical compound to that disclosed in the ‘218 Patent, which is endothermic (it absorbs heat) when it is in contact with the object and is exothermic (it emits heat) when it is not in contact with the object. Fan thus discloses the “Pressure Activated Recharging Compound” limitation of claim 15 under the broadest reasonable interpretation of the terms in the limitation.

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

b. Claim 16

1. The Preamble

The preamble of claim 16 is identical to the preamble of claim 15. For the reasons given above, Fan discloses the preamble of claim 16. (*See* Section VII.D.1.a.1; *see also* Ex. 1003 at 8, Abstract; 14, ¶ 11).

2. The “Temperature Regulation Layer” Limitation

Fan discloses each limitation of the “temperature regulation layer” limitation of claim 15 for the reasons discussed above. (*See* Section VII.D.1.a.2; Ex. 1003 at 14-15, ¶ 16; 18, Figs. 1-2; *see also* Ex. 1010 at 7, 11-12; Ex. 1011 at 10, 18).

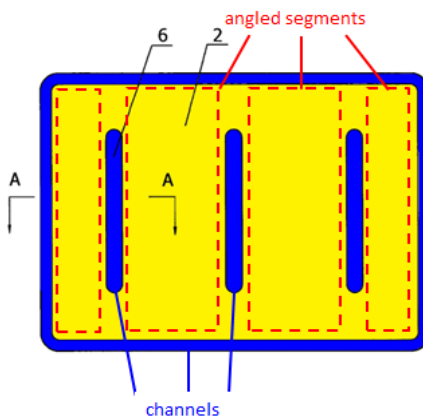
This limitation of claim 16 is nearly identical to the corresponding limitation of claim 15, with two differences. First, whereas claim 15 requires “an angled segment formed by a top side and a bottom side...,” claim 16 requires “a plurality of angled segments, wherein the angled segments within a sealed perimeter of the temperature regulation layer are formed by a top side and a bottom side...” (Ex. 1001 at cl. 16). Second, claim 16 requires that the channels “substantially form sides by contacting the top side with the bottom side at a distance lesser than the predefined distance...” (Ex. 1001 at cl. 16), whereas claim 15 requires that the channels “form sides by contacting the top side with the bottom side...” (*Id.* at cl. 15). Fan discloses both of these differences.



Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

The ‘218 Patent explains that “the angled segments 120 are formed by a top side and a bottom side at a predefined distance” (i.e., the thickness of the temperature regulation layer). (Ex. 1001 at 4:31-32). It also explains that the “predefined distance can equal zero, thus completely forming each angled segment 120 and cutting off any interconnection or communication therein” or that the “predefined distance [may allow] for interconnection between the angled segments 120 of the composition 110A.” (Ex. 1001 at 2:30-32, 2:35-37). Thus, the ‘218 Patent discloses that angled segments exist even where channels do not extend all the way to the perimeter. Claim 16, which requires that the length of the channels be *less than the predefined distance*, expressly covers the latter example.

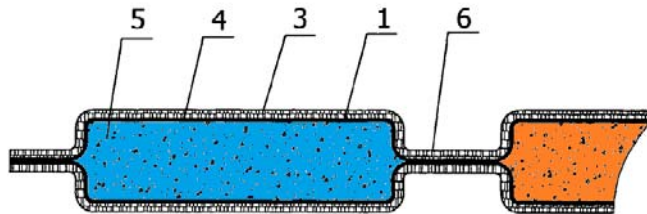
Fig. 1 of Fan illustrates four angled segments having precisely the arrangement contemplated by the ‘218 Patent and recited in claim 16:



(See Section VII.D.1.a.2; Ex. 1003 at 18, Figs. 1; see also Ex. 1003 at 14-15, ¶ 16; 18, Fig. 2). The channels in this embodiment of Fan mirror the embodiment in the ‘218 Patent where “the predefined distance [allows] for interconnection between

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

the angled segments 120 of the composition 110A....” (Ex. 1001 at 2:35-41). They also satisfy claim 16’s requirement that the channels contact the top side and the bottom side “at a distance lesser than the predefined distance.” (Ex. 1001 at 7:32-33). The fact that the reinforcing ribs 6 of Fan perform the same functions of the channels of the ‘218 Patent further confirms the propriety of viewing Fig. 1 of Fan as illustrating four different angled segments. (*Compare* Ex. 1001 at 4:52-57, 5:21-23 *with* Ex. 1003 at 15, ¶ 16). Fig. 2 reinforces Fan’s disclosure of multiple angled segments by illustrating an intentionally truncated cross section that explicitly shows one full angled segment (in blue below) and a portion of a second angled segment (in orange below):



(Ex. 1003 at 18, Fig. 2). Thus, Fan discloses *multiple* angled segments.

Since Fan discloses channels (i.e., elongated grooves) that form sides of the angled segments as discussed above with regard to claim 15 (*see* Section VII.D.1.a.2; Ex. 1003 at 14-15, ¶ 16; 13, ¶¶ 7-8; 9, cl. 1; 18, Fig. 1;), it also discloses the broader concept of channels that *substantially* form sides, as *fully* forming a side would also at least *substantially* form a side. Additionally, the channels or reinforcing ribs are disclosed as being formed by “abutting the surfaces

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

of the two flakes having a plastic layer [and] heating to melt the surface of the plastic layer.” (Ex. 1003 at 13, ¶ 7). In Fan, the top and the bottom sides contact at a distance of zero (i.e., they touch each other); this distance is less than the “predefined distance” required by claim 16 of the ‘218 Patent.

Fan discloses that the cooling platform includes a sealed perimeter by describing the manufacturing process of “sealing the filling orifice...” after the pad is filled with the cooling composition. (Ex. 1003 at 13, ¶¶ 7-8; 9, cl. 1). Thus, the plurality of angled segments is within the outer sealed perimeter of the temperature regulation layer, highlighted as a blue rectangle in Fig. 1 of Fan above. (*Id.*).

3. The “Pressure Activated Recharging Cooling Composition” Limitation

The “pressure activated recharging cooling composition” limitation of claim 16 is identical to the “pressure activated recharging cooling composition” limitation of claim 15. Therefore, for the reasons given above with regard to claim 15, Fan discloses this limitation of claim 16. (*See* Section VII.D.1.a.3; *see also* Ex. 1003 at 8, Abstract; 13, ¶¶ 8-9; 14, ¶ 11; 15, ¶ 16; 16, ¶¶ 20-21).

c. Claims 18 and 19

Claims 18 and 19 are nearly identical to claims 15 and 16, respectively. Specifically, Claim 18 includes the same claim language as Claim 15 and adds the specificity that the “pressure activated recharging cooling composition [is] comprised of water and polyacrylamide.” (Ex. 1001 at 8:15-17). Claim 19

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

includes the same language of claim 16 and similarly adds the specificity that the “pressure activated recharging cooling composition [is] comprised of water and polyacrylamide.” (*Id.* at 8:33-35).

Fan discloses using polyacrylamide as part of the monomer used to make its gel. (Ex. 1003 at 16, ¶ 21). Furthermore, Fan discloses that water is used to make its gel. (*See* Ex. 1003 at 8, Abstract; 16, ¶ 20). Fan therefore discloses the exact composition specifically recited in claims 18 and 19. For the reasons described above with regard to claims 15 and 16, Fan discloses each other limitation of claims 18 and 19. (*See* Sections VII.D.1.a and VII.D.1.b; *see also* x. 1003 at 8, Abstract; 9, cl. 1; 13, ¶¶ 7-9; 14, ¶ 11; 14-15, ¶ 16; 16, ¶¶ 20-21; 18, Figs. 1, 2).

**2. Ground 2: Claims 15, 16, 18, and 19 Are Unpatentable Under 35 U.S.C. § 103 As Obvious Over Fan.**

Ground 2 presents a single-reference obviousness theory that relies on the same reference (Fan) as Ground 1. Petitioner believes that Fan is an anticipatory reference, as discussed above, because it discloses an identical cooling platform product with an identical structural configuration filled with the same composition as is recited in the claims of the ‘218 Patent. Moreover, in the co-pending district court litigation, the only meaningful rebuttal PO presented to Petitioner’s arguments about Fan is that Fan does not disclose the claimed “pressure activated recharging cooling composition.” (Ex. 1010 at 7, 11-12). Petitioner believes this argument is meritless because the precise “pressure activated” composition

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

described and claimed in the ‘218 Patent is described and claimed in Fan. PO also argues, with regard to claims 16 and 19, that Fan does not disclose “a plurality of angled segments.” (Ex. 1010 at 10, 12). Petitioner also believes this argument is meritless because, as explained above, the reinforcing ribs 6 of Fan illustrated in Fig. 1 show *four* angled segments.

Nonetheless, Petitioner presents Ground 2 for three reasons: (1) to further address the only differences PO has ever alleged between the claims and Fan, (2) in the event PO presents an unexpected claim construction argument, and (3) in the event PO attempts to present further distinctions between Fan and the claims.

a. Claim 15

1. The Preamble

As described above, Fan discloses the preamble of claim 15, and thus also renders the preamble obvious. (*See* Section VII.D.1.a.1; Ex. 1003 at 8, Abstract (gel pad with “high heat absorption capacity”); 14, ¶ 11).

2. The “Temperature Regulation Layer” Limitation

Fan discloses the temperature regulation layer having an angled segment in the form of “a gel pad comprising a pouch 2 made of two flakes 1, wherein the two flakes 1 are made of two laminated materials made by coating plastic material on a woven fabric or flocked fabric 3, and a plastic layer 4 is made as an inner layer of the pouch 2.” (Ex. 1003 at 14-15, ¶ 16). Fig. 2 shows that the top and bottom

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

flakes (labeled numeral 1) are joined at points indicated by numeral 6 to form a plurality of pouches each corresponding to the claimed angled segment. (Ex. 1003 at 18, Fig. 2). Fig. 1 of Fan illustrates four angled segments, indicated by dashed red lines, formed by the structures 6 labeled as “channels”; these are very similar to the angled segments identified with numeral 120 in in Fig. 2 and formed by channels 130 of the ‘218 Patent. (*Compare* Ex. 1003 at 18, Fig. 1 *with* Ex. 1001 at Fig. 2). Like the ‘218 Patent, Fan discloses that the laminated materials that can be used as the described “flakes” can be made by “coating plastic material on a woven fabric or flocked fabric 3, and a plastic layer 4 is made as an inner layer of the pouch 2.” (*Compare* Ex. 1003 at 14-15, ¶ 16 *with* Ex. 1001 at 3:32-37). Fan’s discussion of reinforcing ribs 6 further teaches the claimed angled segment and channels. For example, Fan discloses that “[f]or a pouch 2 with a larger area, to prevent large area of separation between the two flakes 1 which would result in movement of the gel 5, one or more *reinforcing ribs* 6 may be provided at the central portion of the pouch 2 during the manufacture thereof to directly bond the two flakes together, and this facilitates folding of the gel pad at the reinforcing ribs 6 as well as ventilation during its use.” (Ex. 1003 at 15, ¶ 16). The reinforcing ribs 6 disclosed in Fan are a further example disclosure of the claimed channels. The reinforcing ribs provide the same advantages (ventilation and minimization of the composition from moving out of the angled segments). (Ex. 1001 at 4:52-57,

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

5:21-23; Ex. 1003 at 15, ¶ 16).

For the reasons given above, Fan not only discloses the claimed angled segment and channels, but it discloses the *same reasons* for providing those structural components. Under the broadest reasonable interpretation of “channel” as “elongated groove,” the structures identified in Fig. 1 as the joining point between the top and bottom flakes of Fan, as well as Fan’s reinforcing ribs 6, are elongated grooves and thus disclose the claimed “channels,” and disclose the claimed angled segment between these channels. These structures therefore also render obvious the claimed “channels” and the claimed angled segment.

In the event PO argues that a “channel” must extend across the entire dimension of the cooling pad (*i.e.* from the perimeter to the perimeter) and that Fan therefore does not disclose the claimed channels, PO is incorrect. Fig. 2 of Fan discloses, to those of skill in the art, a cross section that evidences either the configuration of Fig. 1 or a configuration in which the reinforcing ribs 6 extend fully across the cooling platform. Moreover, a person of skill in the art would understand that extending the reinforcing ribs 6 across the entire cooling platform would further assist in achieving Fan’s stated goals of ventilation and prevention of gel movement among angled segments. (Ex. 1003 at 15, ¶ 16). Such a person of skill would accordingly be motivated to (and would) make such modification.

PO’s infringement argument that the claimed “channels” can include the

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

sealed outer edges of a cooling pad further supports that Fan renders obvious this claim limitation. (Ex. 1011 at 10, 18). Under PO's interpretation of the claims, Fan discloses seven channels (3 reinforcing ribs and 4 sealed outer edges) and four angled segments. (Ex. 1003 at 18, Fig. 1). This is reinforced by PO not disputing in the district court case that Fan discloses the claimed "temperature regulation layer" having the recited structural elements. (Ex. 1010 at 7, 11-12).

3. The "Pressure Activated Recharging Cooling Composition" Limitation

Fan discloses that once the pouch is made by joining flakes as discussed above, it is filled with a monomeric solution including "water, monomer(s), a cross-linking agent and a polymerization initiator." (Ex. 1003 at 13, ¶ 8). This filled pouch is then placed into a heater for heating "so as to facilitate a complete polymerization and to thereby produce a laminated polymer (i.e. a gel)." (*Id.* at 13, ¶ 9). Fan states that "[a]s result of the polymerization of a monomeric solution in the pouch 2, a polymer (i.e. a gel 5) is generated therein." (*Id.* at 15, ¶ 16). Fan thus discloses that the gel component (which corresponds to the pressure activated recharging cooling composition as described below) is within the temperature regulation layer (*i.e.*, the pouch) as required by claim 15.

Fan discloses that the monomers that can be mixed with water (Ex. 1003 at 14, ¶ 11; 16, ¶ 20) to create its gel can be (but are not limited to) "highly absorbent polyacrylamide materials, e.g. *polyacrylamide* and/or methyl polyacrylamide."



Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

(Ex. 1003 at 16, ¶ 21). The monomeric solution disclosed in Fan includes the same components (*i.e.*, water and polyacrylamide) as the described embodiment of the ‘218 Patent where “the composition 110A can be activated by pressure, wherein the pressure of an object sitting on the cooling platform 100 activates the composition 110A...” (Ex. 1001 at 3:17-19; *see also id.* at cls. 17, 18, and 19). Under the broadest reasonable interpretation of the ‘218 Patent’s recitation of a “pressure activated recharging cooling composition,” Petitioner submits that Fan’s recitation of the exact composition described and claimed in the ‘218 Patent discloses the composition required by this limitation.

Fan discloses that its composition is a cooling composition with good endothermic performance. (*See* Ex. 1003 at 8, Abstract (“[T]he gel has a *water* content of about 70% and hence a high heat absorption capacity.”); *see also id.* at 14, ¶ 11). As described above, under the broadest reasonable interpretation of “pressure,” Fan discloses that its cooling composition is activated when a warm object *contacts* the pad and deactivated when the warm object *loses contact* with the pad. (*See* Section VII.D.1.a.3; Ex. 1003 at 8, Abstract; 13, ¶¶ 8-9; 14, ¶ 11; 15, ¶ 16; 16, ¶¶ 20-21). Also under the broadest reasonable interpretation, Fan discloses a cooling composition that is endothermically activated and endothermically deactivated as those claim terms are properly construed. (*Id.*).

If PO argues that pressure involves an application of non-zero *force*, contact

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

between two objects results in a non-zero force being applied by the objects to one another. Moreover, Fan discloses that the object resting on its gel pad is applying a non-zero force equal to the weight of the object. (Ex. 1003 at 13, ¶ 3 (gel pad products “not prone to being pierced through or squeezed”)). Indeed, one of the problems Fan solved is that “excessive pressure [on known pads] cause[d] the water pad to be burst....” (Ex. 1003 at 12, ¶ 2). Thus, Fan discloses that it is the pressure of the object on the gel pad that activates the transfer of heat to the gel, and the lack of pressure that activates the transfer of heat out of the gel.

Petitioner expects that PO will argue that despite Fan’s disclosure of the precise composition described and claimed in the ‘218 Patent as being a “pressure activated recharging cooling composition endothermically activated and endothermically deactivated upon the application and release of pressure,” Fan’s failure to use the word “pressure activated” somehow distinguishes the challenged claims. Petitioner submits that those of skill in the art reading Fan and the ‘218 Patent would understand that both references describe compositions of water and polyacrylamide and thus both naturally disclose the *properties* of polyacrylamide. However the claims of the ‘218 Patent are construed, the claims are merely reciting a *property* of a water/polyacrylamide composition. A person of skill in the art would understand that Fan’s disclosure of the identical composition used in a cooling platform teaches or suggests the properties of that composition, including

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

whatever properties of that composition are being claimed in this limitation.

b. Claim 16

1. The Preamble

The preamble of claim 16 is identical to the preamble of claim 15. For the reasons given above, Fan discloses and/or renders obvious the preamble of claim 16. (*See* Section VII.D.2.a.1; Ex. 1003 at 8, Abstract; 14, ¶ 11).

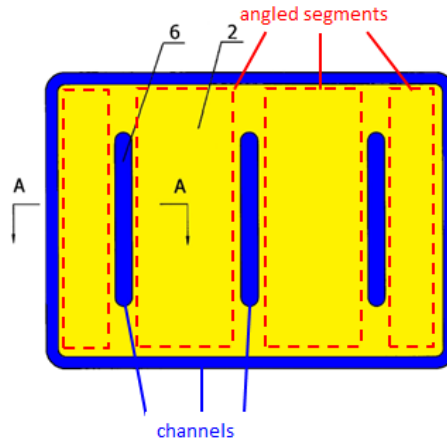
2. The “Temperature Regulation Layer” Limitation

Fan discloses each limitation of the “temperature regulation layer” limitation of claim 15 for the reasons discussed above. (*See* Section VII.D.1.a.2; Ex. 1003 at 14-15, ¶ 16; 18, Figs. 1-2; *see also* Ex. 1010 at 7, 11-12; Ex. 1011 at 10, 18).

PO has conceded in district court that Fan discloses a *single* angled segment. (Ex. 1010 at 7, 11). Petitioner expects that PO will assert that Fan does not disclose this limitation of claim 16 because “Fan [does] not disclose ‘a plurality of angled segments.’” (Ex. 1010 at 11). Petitioner disagrees, as discussed above. (*See* Section VII.D.1.b.2; Ex. 1003 at 9, cl. 1; 13, ¶¶ 7-8; 14-15, ¶ 16 (reinforcing ribs 6); 18, Figs. 1, 2; Ex. 1001 at 2:35-41 (describing a plurality of angled segments where channels do not extend to the perimeter of the cooling platform). In the event Fan is found to disclose only a single angled segment, Fan teaches or suggests a plurality of angled segments, and renders this limitation obvious.

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

Fig. 1 of Fan illustrates three “channels” (*i.e.*, elongated grooves in the form of reinforcing ribs 6, in blue below) that at least partially subdivide the cooling pad into *four* segments (in red):



(Ex. 1003 at 18, Fig. 1). Fan also discloses that the cooling platform includes a sealed perimeter by describing that part of the manufacturing process includes “sealing the filling orifice...” after the heating pad is filled with the cooling composition (*Id.* at 13, ¶ 8; 16, ¶ 20). Thus, as is also evident from Fig. 1, the entirety of the yellow area illustrated above is within the outer sealed perimeter of the temperature regulation layer, highlighted as a blue rectangle above. This is entirely consistent with the discussion in the ‘218 Patent that a “predefined distance can equal zero, thus completely forming each angled segment 120 and cutting off any interconnection or communication therein” or that the “predefined distance [may allow] for interconnection between the angled segments 120 of the composition 110A.” (Ex. 1001 at 2:30-32, 2:35-37). In other words, just as in Fan, the ‘218 Patent contemplates that a plurality of angled segments can exist

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

even where the channels do not extend to the perimeter, allowing for interconnection of the composition between angled segments.

If PO is correct that Fan only discloses a single angled segment because the channels (illustrated with numeral 6 in Fig. 1) do not extend to the perimeter, it would have been obvious to extend the channels of Fan to the perimeter of the mat, for example to better achieve the stated goal of “facilitate[ing] folding of the gel pad at the reinforcing ribs 6 as well as ventilation during its use.” (Ex. 1003 at 15, ¶ 16). An artisan would have recognized that the channels described in the ‘218 Patent and the ribs disclosed in Fan describe common objectives and are technical solutions to the same problems. (Ex. 1001 at 4:52-57, 5:21-23). An artisan would have had a reasonable expectation of success when using the features disclosed in Fan to achieve the capabilities of the cooling platform described in the ‘218 Patent. This is reflected in Fan’s disclosure, in Fig. 2, that multiple discrete pouches can be formed. (Ex. 1003 at 18, Fig. 2). It would have been obvious to modify Fan to extend the reinforcing ribs 6 to the perimeter of the cooling platform; it appears PO concedes this would result in a plurality of angled segments. (Ex. 1011 at 12).

Fan also renders obvious claim 16’s requirement that the channels “substantially form sides by contacting the top side with the bottom side at a distance lesser than the predefined distance.” Even if an artisan determined that Fan did not disclose channels that contact the top side and the bottom side of the

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

temperature regulation layer “at a distance lesser than the predefined distance” (as required by claim 16), it would have been obvious to allow for interconnection between the angled segments by not fully sealing the top surface and bottom surface together. In fact, Fan discloses such an interconnection in Fig. 1 by not extending the reinforcing ribs along the entire top and bottom surface of the cooling pad. (Ex. 1003 at 18, Fig. 1). Changing the depth of the ribs (*i.e.*, channels) in Fan would not only have been obvious, but would also still achieve the same purpose of further preventing “movement of the gel 5” and to facilitate additional “ventilation during [the gel pad’s] use.” (Ex. 1003 at 15, ¶ 16).

For these reasons, Fan discloses or renders obvious the “Temperature Regulation Layer” limitation of claim 16 of the ‘218 Patent.

3. The “Pressure Activated Recharging Cooling Composition” Limitation

This limitation of claim 16 is identical to the corresponding limitation of claim 15. For the reasons given above with regard to claim 15, Fan renders this limitation obvious. (*See* Section VII.D.2.a.3; *see also* Ex. 1003 at 8, Abstract; 13, ¶¶ 8, 9; 14, ¶ 11; 15, ¶ 16; 16, ¶¶ 20, 21; *see also* Ex. 1001 at 3:17-19).

c. Claims 18 and 19

As discussed above, Fan renders obvious each limitation of claims 15 and 16 (and thus their identical limitations in claims 18 and 19). (*See* Sections VII.D.2.a and VII.D.2.b). Fan specifically discloses the specific “pressure activated

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

recharging cooling composition” of the sole added limitation of claims 18 and 19. (Ex. 1003 at 16, ¶ 20 (water), 16, ¶ 21 (polyacrylamide)). Fan therefore renders claims 18 and 19 obvious.

**3. Ground 3: Claims 15 And 16 Are Unpatentable Under 35 U.S.C. § 103 As Anticipated By Xiong.**

Xiong was filed on April 14, 2005 issued as U.S. Patent No. 7,324,340 on January 29, 2008. (Ex. 1004) Xiong is prior art under 35 U.S.C. § 102(b). Xiong was not considered during examination of the ‘218 Patent.

Xiong discloses a “cooling pad that does not require any electrical power to operate.” (Ex. 1004 at 8, Abstract). Xiong discloses that the “cooling pad contains a phase-changing compound... and may be made of a soft, flexible material that will contain the phase-changing compound and prevent excess shifting within the cooling pad.” (*Id.*). Xiong describes various configurations for its press seal means (examples of which include “stitching or some other way of subdividing the top portion of the housing” (*see id.* at 3:10-12) to prevent or restrict the shifting of its phase-changing compound within the cooling pad. (*Id.* at Figs. 6-8, 4:20-25).

a. Claim 15

1. The Preamble

Xiong discloses an “external cooling pad for use between the user’s lap and the hot, bottom surface of a conventional laptop computer.” (Ex. 1004 at 3:2-5, 3:57-58; *see also id.* at Abstract; 1:7-10). Xiong discloses the preamble.

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

2. The “Temperature Regulation Layer” Limitation

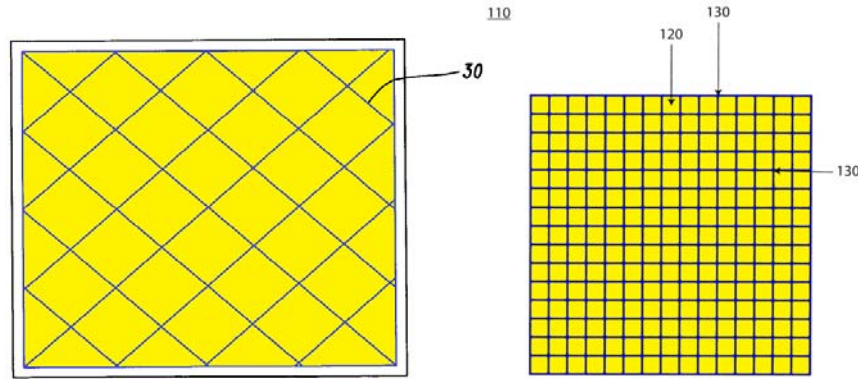
Xiong discloses:

A separate, external cooling pad...includes a flexible housing with a top portion made of a liquid impermeable material and divided into a number of pockets containing phase change material. The pockets are preferably formed by a number of press seals to limit or entirely prevent shifting of the phase change material about the top portion of the housing.

(Ex. 1004 at 3:1-12). The flexible housing divided into pockets discloses the “temperature regulation layer” described in the ‘218 Patent.

Like the ‘218 Patent, the housing of Xiong that defines the “temperature regulation layer” is made of plastic material and fabric. (*Compare* Ex. 1001 at 3:32-37 *with* Ex. 1004 at 4:4-9 (“the top portion 12 of the preferred embodiment cooling pad 10 may be further described, which includes upper 20 and lower 22 layers of liquid-impervious fabric, connected together around the perimeter and further there are press seal means distributed about the top portion”)). The upper layer and lower layer correspond to the “top side and a bottom side” that form the claimed angled segment. Fig. 8 of Xiong (left below), in which channels extend to the perimeter, is nearly identical to Fig. 2 of the ‘218 Patent (right below):



Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

(Ex. 1004 at Fig. 8; Ex. 1001 at Fig. 2). In this example, each diamond illustrated in Xiong is an example of an angled segment corresponding to the angled segments as illustrated by numeral 120 (Ex. 1001 at 2:25-27) in Fig. 2 from the '218 Patent. (Ex. 1004 at Fig. 8, 3:10-12, 4:3-8, 4:15-19; *see also id.* at Figs. 6-7, 4:20-25).

The press seal means and/or stitching pattern disclosed in Xiong are examples of the claimed channels, in that they form elongated grooves in the cooling pad. (Ex. 1004 at 3:5-12 (subdividing the housing); 4:15-17 (press seal means “that bring together the upper 20 and lower layers...”). This is further evidenced by the disclosure that they “maintain a relatively equal distribution of the pellets 24 across the top portion 12 of the cooling pad 10.” (Ex. 1004 at 4:17-19). The press seal means of Xiong serve the same purpose as the “channels” of the '218 Patent: “limit[ing] or entirely prevent[ing] shifting of the phase change material about the top portion of the housing.” (Ex. 1004 at 3:1-12; *see also id.* at Abstract, 4:15-19, 4:22-25; Ex. 1001 at 4:52-57).

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

The only alleged deficiency PO identified in the district court case is that Xiong does not disclose “a pressure activated cooling composition” because “the cooling pad of Xiong is temperature activated.” (Ex. 1010 at 8). PO has therefore conceded that the above analysis shows that Xiong discloses the claimed temperature regulation layer and its structural requirements.

3. The “Pressure Activated Recharging Cooling Composition” Limitation

The PCM used in Xiong is an example of the claimed pressure activated recharging cooling composition and thus discloses this limitation.

First, Xiong is clear that its “pockets contain[] phase change material.” (Ex. 1004 at 3:5-10; *see also id.* at 4:15-25). Since the pockets correspond to the claimed angled segments, Xiong discloses pressure activated recharging cooling composition *within* the temperature regulation layer as required.

Xiong teaches that:

Phase change material (PCM) is a name shared by chemical compounds that possess the physical property of changing between solid phase and liquid phase at a desirable temperature range. Examples of the PCM include compounds such as sodium sulfate decahydrate, sodium carbonate decahydrate, disodium phosphate dodecahydrate or sodium thiosulfate pentahydrate. In the process of a phase change, either melting or solidifying, the material respectively absorbs or releases a large amount of per-mass thermal energy, or ‘heat of fusion’. This process requires very small to no temperature or

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

volume change of the PCM. This property can be utilized to store away excessive heat produced by a micro computer during operation when the PCM turns into liquid, and slowly release the heat when the computer is not being used when the PCM solidifies again.

(Ex. 1004 at 2:40-55). By virtue of disclosing using “a type of PCM pellets 24 as the main coolant,” Xiong discloses a pressure activated recharging cooling composition that is endothermically activated and endothermically deactivated upon the application and release of pressure, respectively. (Ex. 1004 at 4:34-36). Specifically, Xiong discloses that upon contact with a hot object, the PCM becomes endothermic: “the cooling pad 10 is placed outside and under the computer in a way such that the pad 10 comes into contact with the bottom face of the computer over a large enough area to allow effective heat transfer away from the computer housing via conduction.” (Ex. 1004 at 4:28-33; *see also id.* at 4:38-42, 4:52-56). It thus discloses “effective heat transfer away from the computer housing via conduction” when the “cooling pad 10 comes into contact with the bottom face of the computer.” (Ex. 1001 at 4:43-45, 4:50-51; Ex. 1004 at 4:30-33). Xiong explains that “[a]s heat transfers into the pellets 24 they will begin and eventually complete the phase change process from a solid into a liquid, thereby absorbing substantial amounts of heat rather than reflecting that heat back into the computer or passing it through to the user’s lap.” (Ex. 1004 at 4:38-42). Under the broadest reasonable interpretation of “pressure” as *contact*, when the hot object

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

contacts the cooling mat of Xiong, the material *becomes endothermic* and absorbs heat from the hot object, as required by this claim. Xiong also discloses that the PCM “slowly release[s] the heat when the computer is not being used when the PCM solidifies again.” (Ex. 1004 at 2:55-57). Thus, when the hot object is removed and *contact* (i.e., pressure) is eliminated, the material *becomes exothermic* and releases heat into the ambient air as the PCM solidifies. Finally, Xiong clearly states that “This process can be repeated as desired,” (Ex. 1004 at 2:56) satisfying the claims’ requirement that the composition be “recharging.”

PO argues that Xiong does not disclose the claimed pressure activated recharging cooling composition because “Xiong is temperature activated.” (Ex. 1010 at 10). However, as described above, the broadest reasonable interpretation of “pressure” is “contact.” Since Xiong’s PCM only changes phases when heat is transferred due to *contact* with the hot object, Xiong does disclose this limitation under the claim construction standard applicable here.

If PO argues that “pressure” involves an application of non-zero *force*, mere *contact* between two objects results in a non-zero force being applied by the objects to one another. Moreover, Xiong discloses that the object resting on its cooling pad (a computer) is applying a non-zero force equal to the weight of the object. (Ex. 1004 at 4:28-34). Thus, Xiong discloses that the pressure of the laptop activates the PCM, and the lack of pressure that deactivates the PCM.

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

b. Claim 16

1. The Preamble

For the reasons given regarding claim 15, Xiong discloses the preamble of claim 16. (*See* Section VII.D.3.a.1; *see also* Ex. 1004 at 1:7-10, 3:1-3, 3:57-58).

2. The “Temperature Regulation Layer” Limitation

Xiong discloses each limitation of the “temperature regulation layer” limitation of claim 15 for the reasons discussed above. (*See* Section VII.D.3.a.2; *see also* Ex. 1004 at Abstract; 3:3-12; 4:4-9; 4:15-19; 4:20-25; Figs. 6-8).

Claim 16 is different from claim 15 in that it requires a plurality of angled segments rather than a single angled segment. Xiong discloses “pockets [that] are preferably formed by a number of press seals to limit or entirely prevent shifting of the phase change material about the top portion of the housing. The press seal may be stitching or some other way of subdividing the top portion of the housing.” (Ex. 1004 at 3:8-12). Several of the Figures of Xiong illustrate a plurality of angled segments in the form of a plurality of pockets. (*See, e.g.*, Ex. 1004 at Figs. 7, 8; *see also id.* at 3:10-12, 4:3-7, 4:15-19; *see also id.* at Figs. 6-7, 4:20-25). The housing divided into a *number of pockets* discloses the claimed “temperature regulation layer having a *plurality of angled segments*.”

Claim 16 is also different from claim 15 in that it requires that the channels “substantially form sides by contacting the top side with the bottom side at a

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

distance lesser than the predefined distance...” (Ex. 1001 at cl. 16). Xiong discloses that “[t]he pockets are preferably formed by a number of press seals to *limit* or entirely prevent shifting of the phase change material about the top portion of the housing.” (Ex. 1004 at 3:8-10). Furthermore, Xiong discloses that the press seal means 26 “helps *maintain a relatively equal distribution* of the pellets 24 across the top portion 12 of the cooling pad 10.” (*Id.* at 4:17-19). Thus, the press seal means disclosed in Xiong describe elongated grooves that “*substantially form sides* by contacting the top side with the bottom side at a distance lesser than the predefined distance” because they limit shifting of the PCM and maintain a relatively equal distribution of the PCM.

The only alleged deficiency PO identified in the district court case is that Xiong does not disclose “a pressure activated cooling composition” because “the cooling pad of Xiong is temperature activated.” (Ex. 1010 at 8). PO has therefore conceded that the above analysis shows that Xiong discloses the claimed temperature regulation layer and its structural requirements.

3. The “Pressure Activated Recharging Cooling Composition” Limitation

The “pressure activated reaching cooling composition” limitation of claim 16 is identical to the “pressure activated recharging cooling composition” limitation of claim 15. Therefore, for the reasons given above with regard to claim 15 Xiong discloses this limitation of claim 16. (*See* Section VII.D.3.a.3; *see also*

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

Ex. 1004 at 2:40-57; 3:5-10; 4:15-25; 4:28-36; 4:38-45; 4:52-56).

**4. Ground 4: Claims 15, 16, 18, And 19 Are Unpatentable Under 35 U.S.C. § 103 As Obvious Over Xiong in view of Fan.**

A person of ordinary skill in the art would have been motivated to combine Xiong with Fan before the filing date of the '218 Patent to result in the gel pad of Fan with the different channel configurations (*e.g.*, channels achieved using press seal techniques and/or different stitching patterns) as disclosed by Xiong. (Ex. 1004 at 3:8-12; 4:15-16; 4:20-25; and Figs. 6-8). An artisan would have understood that both Fan and Xiong disclose cooling platforms directed to solving the common problem of cooling objects. (Ex. 1004 at Abstract; Ex. 1003 at 8, Abstract). For example, Fan discloses a general use cooling gel pad and a method of production, while Xiong focuses on the specific commercial application of a laptop computer cooling pad. (Ex. 1003 at 8, Abstract; Ex. 1004 at Abstract). As such, it would have been obvious to try to use the features of Fan and/or Xiong together to create improved cooling pads.

An artisan would further have understood that both Fan and Xiong teach cooling an object with a cooling composition encased within an outer layer of the cooling pad. Therefore, an artisan would recognize that the incorporation of Xiong's channels into Fan's gel pad would predictably result in an improved cooling platform, with each reference contributing its known properties and

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

advantages. Fan’s and Xiong’s express disclosure of the advantages and necessity of having “channels” to reduce the movement of the composition within the cooling platform constitutes a teaching, suggestion, or motivation to combine Fan with Xiong, since both described similar solutions to the same problem. Additionally, it would be well within the grasp of a person of ordinary skill in the art studying cooling mat disclosures to look to Xiong, which teaches a “pad 10 [that] does not require electrical power to operate, and will effectively and efficiently reduce the operating temperature inside a micro computer’s housing through conductive heat dissipation via the bottom face of the computer.” (Ex. 1004 at 4:52-56). A person of ordinary skill could have readily used Xiong’s press seal means or stitching pattern to create different channel configurations in the gel pad disclosed in Fan. Thus, the combination of Fan and Xiong is proper.

The combination of Fan and Xiong results in a cooling pad that uses Fan’s disclosed gel in a pad having Xiong’s disclosed structural configuration, and therefore renders claims 15, 16, 18, and 19 obvious.

a. Claims 15 and 16

As described with regard to Ground 3 above, Xiong anticipates claims 15 and 16 of the ‘218 Patent. (Sections VII.D.3.a and VII.D.3.b). If PO is successful in arguing that the PCMs disclosed in Xiong are inapplicable because they are “temperature activated,” (PO’s only argument against invalidity based on Xiong in



Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

district court, *see* Ex. 1010 at 8), the combination of Xiong and Fan disclosed above renders claims 15 and 16 obvious. Specifically, when Xiong and Fan are combined as described above, the gel containing polyacrylamide and water of Fan is used in the cooling pad of Xiong. The Fan gel discloses the claimed “pressure activated recharging cooling composition.” (*See* Sections VII.D.1.a.3 and VII.D.1.b.3; Ex. 1003 at 8, Abstract; 13, ¶¶ 8, 9; 14, ¶ 11; 15, ¶ 16; 16, ¶¶ 20, 21; *see also* Ex. 1001 at 3:17-19). Thus, the incorporation of Fan’s composition into the cooling mat of Xiong renders claims 15 and 16 obvious.

b. Claims 18 and 19

As described in detail with regard to Ground 1 above, Fan discloses the identical composition to the preferred composition described and claimed in the ‘218 Patent. (*See, e.g.*, Section VII.D.1.a.3, Section VII.D.1.c; Ex. 1003 at 8, Abstract; 13, ¶¶ 8, 9; 14, ¶ 11; 15, ¶ 16; 16, ¶¶ 20-21). Petitioner submits that those of skill in the art reading Fan and the ‘218 Patent would understand that both references describe compositions of water and polyacrylamide and thus both naturally disclose the *properties* of polyacrylamide. However the claims of the ‘218 Patent are construed, the claims are merely reciting a *property* of a water/polyacrylamide composition. A person of skill in the art would understand that Fan’s disclosure of the identical composition used in a cooling platform teaches or suggests the properties of that composition, including whatever

Petition For *Inter Partes* Review Of U.S. Patent No. 8,720,218

properties of that composition are being claimed in this limitation.

As discussed in Ground 3, Xiong discloses the temperature regulation layer, including the recited channels and angled segment(s), required by claims 15 and 16. (Sections VII.D.3.a.2 and VII.D.3.b.2; Ex. 1004 at 3:1-12, 4:3-9, 4:15-19; 4:20-25, Figs. 6-8). PO agrees. (Ex. 1010 at 10). When Xiong and Fan are combined as described above, Fan's gel (containing polyacrylamide and water) is used in the cooling pad of Xiong. This combination remedies the only deficiency of Xiong with regard to claims 18 and 19, which narrow claims 15 and 16 by requiring that the "pressure activated recharging cooling composition [is] comprised of water and polyacrylamide." (Ex. 1001 at 8:15-17, 8:33-35).

**VIII. CONCLUSION**

For the foregoing reasons, Petitioner requests that the Board grant this Petition and cancel claims 15, 16, 18, and 19 of the '218 Patent.

Respectfully submitted

By: /Jason A. Engel/  
Reg. No. 51,654  
Jason A. Engel  
Customer No. 24573  
Date: October 30, 2015  
K&L Gates LLP  
e-mail: jason.engel@klgates.com  
telephone number: 312-807-4236  
fax number: 312-827-8196  
70 W. Madison Street, Suite 3100  
Chicago, IL 60602

**Certification of Service Under 37 C.F.R. § 42.6(e)(4)**

A copy of this Petition for *Inter Partes* Review and supporting materials have been served to the Patent Owner via Federal Express Overnight Delivery to the following correspondence address of record on this 30<sup>th</sup> day of October, 2015:

Reid Dammann  
GORDON REES LLP  
633 West Fifth Street  
52nd Floor  
Los Angeles, CA 90071

By: /Jason A. Engel/  
Reg. No. 51,654  
Jason A. Engel  
Customer No. 24573  
Date: October 30, 2015  
K&L Gates LLP  
e-mail: jason.engel@klgates.com  
telephone number: 312-807-4236  
fax number: 312-827-8196  
70 W. Madison Street, Suite 3100  
Chicago, IL 60602